

## PROCEEDINGS OF LEARNED SOCIETIES.

## ZOOLOGICAL SOCIETY.

May 24, 1853.—Dr. Gray, Vice-President, in the Chair.

NOTES ON A CETACEOUS ANIMAL STRANDED ON THE NORTH-EAST COAST OF IRELAND.

BY GEORGE GULLIVER, F.R.S.

On Saturday, May 14, 1853, a herd of cetaceous animals appeared at Dundrum Bay, many of which got away, and others were stranded. I saw on the following days about twenty-five of them lying dead there on the sand. The largest was nearly nineteen feet, and the smallest between nine and ten feet long. They were all furnished with perfect teeth. The greater number were females; in a group of nine large ones, lying near together, six were females and three males.

I was told that their death-throes were dreadful; they rose on their tails, bellowed like bulls, floundered about, and spouted bloody sand and water, as they were attacked with different destructive instruments by the peasantry. From one of the animals, between sixteen and seventeen feet long, a perfect foetus, presently to be described, was taken, so that the breeding time of this species may be considered as now determined. One of them had the iron head of a harpoon imbedded in its back, and the wound completely healed over. In the second large compartment of the stomach were numerous fish-bones, completely denuded of all soft parts by digestion. The following measurements may be useful for future reference :—

*Measurements of a Male.*

	ft.	in.
Length from the snout to the end of the middle of the tail . . . . .	18	6
Greatest girth, excluding back fin . . . . .	12	6
Length of pectoral fin . . . . .	5	0
Breadth of base of pectoral fin . . . . .	1	0
Breadth of pectoral fin at one foot from its point . . . . .	0	4
Length of base of back fin . . . . .	3	0
Height of back fin . . . . .	1	2
Breadth of tail from point to point . . . . .	3	10

*Measurements of a Female.*

	ft.	in.
Length from snout to end of middle of tail . . . . .	16	0
Greatest girth, excluding back fin . . . . .	9	0
Girth one inch behind eyes . . . . .	5	3
Length of each side of mouth . . . . .	1	0
From snout to eye . . . . .	1	6
From eye to blowhole . . . . .	1	2
From snout to base of pectoral fin . . . . .	2	10
The blowhole behind a line intersecting the eyes . . . . .	0	1

	ft.	in.
From the snout to beginning of dorsal fin . . . . .	4	11
From the end of the base of the dorsal fin to the end of the middle of the tail . . . . .	8	6
From snout to vent . . . . .	10	4
From snout to the orifice of the vagina . . . . .	10	0
From snout to the mammary slits . . . . .	10	0
From point of lower jaw to the navel . . . . .	6	0
From the eye to the angle of the mouth . . . . .	0	4 $\frac{3}{4}$
The eye above a line drawn from the base of the upper jaw along centre of the sides of the body . . . . .	0	3
From the knob of the snout to the upper lip . . . . .	0	10
Length of the mammary slit . . . . .	0	3 $\frac{1}{2}$
Transverse distance from mammary slit to orifice of the vagina . . . . .	0	4
Dorsal fin at its base . . . . .	2	6
Dorsal fin over its convexity . . . . .	3	0
Height of dorsal fin . . . . .	1	2
Length of pectoral fin . . . . .	3	5
Breadth of base of pectoral fin . . . . .	0	10
Length of opening of eyelid . . . . .	0	1 $\frac{1}{4}$
Diameter of eyeball . . . . .	0	1 $\frac{3}{8}$
Diameter of cornea . . . . .	0	1 $\frac{1}{8}$
Length of crown of tooth . . . . .	0	1 $\frac{5}{8}$

#### Measurements of a Fœtus.

	ft.	in.
Length from snout to the end of the middle of the tail . . . . .	4	8
Girth, excluding back fin . . . . .	2	5 $\frac{1}{2}$
From centre of snout to opposite the base of the pectoral fin . . . . .	1	0
Snout to beginning of the back fin . . . . .	2	0
From the upper lip to the blowhole . . . . .	0	9
From point of lower jaw to navel . . . . .	2	1
From point of lower jaw to vagina . . . . .	2	10
From the eye to the centre of the snout . . . . .	0	7
Length of base of back fin . . . . .	0	8
Height of back fin . . . . .	0	3
Length of pectoral fin . . . . .	0	11 $\frac{1}{2}$
Breadth of base of pectoral fin . . . . .	0	3 $\frac{1}{2}$
Length of intestines . . . . .	30	0

*Anatomy.*—Through the kindness of Mr. Brabazon, the excellent surgeon of Downpatrick, I had an opportunity of examining the fœtus of which the measurements have just been given. As the dissection was suddenly stopped, the details are imperfect, though accurate as far as they go. The skin was of a dark leaden colour, and the blubber on the sides of the body about half an inch thick. There were soft fringes or processes of the gums, corresponding in situation and number to the coming teeth.

The thymus of moderate size, at the usual situation in the chest,

and sending no process to the neck. The spleen and a spleniculus together scarcely so big as a walnut. A flat rounded gland, about three-fourths of an inch in diameter, situated above the renal vessels on each side, and at a distance of upwards of an inch from the kidney, had more the appearance of a lymphatic gland than of the supra-renal body.

On opening the chest, each lung was seen to be covered with lymphatic vessels, running to a gland at the sterno-ventral aspect of the free edge of the lung. The gland was very juicy, had every appearance of a lymphatic gland, and measured one inch and a quarter long and five-eighths broad. This pulmonary gland in the adult is harder, more fibrous, and less juicy, and measures four and a half inches long by two broad.

The stomach with two chief compartments; the first continuing backwards on a line with the gullet, and lined, like it, with a white thick smooth membrane and epithelium; the second, or true digesting stomach, lined with a mucous membrane in folds, and somewhat smaller than the first, of a more rounded form, and extending from its middle to the duodenum. In the first was a quantity of thick, opake, whitish fluid, and in the second a little mucus.

There was no gall-bladder. The bile-duct, close to the duodenum, was as thick as a goose quill. The last portion of the intestine was full of meconium, like that of the human foetus.

There was no caecum; the intestines were nearly uniform in size throughout, their surface smooth and not at all cellulated. Length of the whole intestinal canal, from stomach to vent, thirty feet.

The kidneys large and lobulated throughout; the lobules from a quarter to half an inch in diameter, and having each a very delicate capsule of connecting tissue. The blood-vessels enter the kidney, not near its middle, but at its fore and inner or atlanto-mesial end.

The mesenteric glands moderate in size and number, of uniform consistency, and without any cavity or hollow in them, unlike those of the whale described by Mr. Abernethy.

The womb with two horns, and the ovaries in the usual situation; mammary slits on a level with and near to the orifice of the vagina. Urinary bladder empty, and the urethra opening just behind the clitoris.

*Descriptive Characters.*—Teeth conical and slightly curved inwards, from eight to twelve on each side of the jaws, making from thirty-two to forty-eight teeth altogether; but eleven on either side of each jaw is a common number, and there is sometimes one more in the upper than in the under jaw on each side. Dorsal fin large, convex above and extending behind into a hooked or curved point. Pectoral fins long, narrow, and tapering to a point. Tail crescent-shaped. Mouth sloping downwards and forwards. Eyes above and behind the angles of the mouth. Top of the head round, and not prominent, though the snout is remarkably so. No nipples yet protruding, but merely a longitudinal mammary slit on each side of the orifice of the vagina in the female; a large penis in the male. Skin smooth, shining, and black throughout, save two whitish-brown patches at the throat and

near the vent and genitals; in a few males and females this light colour extends in a narrow strip from these points along the under part of the body, but never behind the eye, or elsewhere.

The blubber was  $1\frac{5}{8}$ ths inch thick on the sides, much thicker on the back, and composing the whole thickness of the snout. The cuticle, which on its outer surface was like oil skin, when stripped off, exhibited on its under side a jet-black velvet-like rete mucosum, furnished with a very great abundance of black pigment. Around the eyeball was a firm bony plate in the sclerotic coat; and a white funnel-shaped ligament, extremely thick, tough and strong, was attached by its base to the eyeball, and surrounded the optic nerve.

As there is no opportunity here of consulting the published descriptions and figures of the Cetacea, I am uncertain at present of the species of this one. It does not correspond with any description in the Rev. Leonard Jenyns's 'Manual of the Vertebrata,' a copy of which is my travelling companion. The present animal approaches nearest to his Grampus (*Delphinus orca*) and Ca'ing Whale (*D. melas* of Traill and *D. deductor* of Scoresby). But it is smaller than either of them, though I suspect it will prove to be Traill's *D. melas*, and has not the white spot behind the eye, nor the broad pectoral fins of the Grampus, nor the very convex top to the head, the small average number of teeth (which he makes only twenty-four in all), nor the colour of the skin of his Ca'ing Whale. The animals which I examined had a convex rounded snout, its thickness made up of gristly blubber, which it is possible may have been erroneously described as the "top of the head." The Rev. Charles Archibald, whom I had the pleasure of meeting among the carcasses, directed my attention to the difference between the pectoral fins of this species and those of the Grampus.

The relative position of the back fin, so much more forward in the adult than in the foetus, is remarkable; and, indeed, the comparative measurements exhibit some interesting facts as to development.

Dundrum, co. Down, May 20, 1853.

*Postscript.*—The animal is undoubtedly the same as that described under the name of the Uyea Sound or Ca'ing Whale by Mr. Patrick Neill in 1806, and afterwards figured by Dr. Traill from a drawing by Mr. James Watson; by Cuvier; by Captain Scoresby, Mr. Bell, and Mr. Couch.

But though these figures are sufficient to identify the species, they all represent the pectoral fin as narrower at the base than it really is; and most of them show a twist of the tail, which was observed in none of the specimens at Dundrum Bay. Cuvier's plate is the only one that gives an idea of the pointed end of the dorsal fin; all the others represent this posterior termination of the fin too blunt, rounded, or short, though Mr. Couch correctly describes it as falcate.

No doubt, the foetus, 4 feet 8 inches long, from Dundrum Bay, was nearly ready for birth in the middle of May. Dr. Traill mentioned sucklings five feet long in December 1806, at Scapay Bay, one

of the Orkneys; Mr. Neill says that most of the adult females at Uyea Sound, Unst, were either pregnant, or giving suck to their toothless young, in February and March 1805; and in January 1812, in the neighbourhood of Paimpol, near the northern extremity of Bretagne, M. Lamaout found the young seven or eight feet long, and with cuttle-fish, cod, and milk in their stomachs.

M. F. Cuvier states that this species is remarkable for the spherical form of the anterior part of the head, and that his brother had named it "*globiceps*, à cause de la forme arrondie de sa tête." But the "very rounded top of the head," or "remarkably convex and prominent forehead," included by systematic writers in the specific characters of the Ca'ing Whale, and even among the otherwise judicious observations of Mr. Couch, does not properly belong to it; for the forehead of the skull is flat, as in other porpoises, though the prominent upper muzzle or snout-knob is sufficiently remarkable, and not badly represented in the plates already mentioned.

But, as I have caused a young skull to be sent to the British Museum, and Mr. Brabazon has presented a complete skeleton of the adult male animal to the same national collection, Dr. Gray has examined them, and that eminent zoologist has favoured me with the following note of the result:—"I have compared the skeleton with the species which have been usually described under the name of *D. globiceps*, and it would appear that the shape of the head of the animal scarcely justified that name; I can find no difference between the Irish and the other specimens."

June 14.—Dr. Gray, F.R.S., Vice-President, in the Chair.

Dr. Crisp exhibited the alimentary canal and ova of a Cuckoo (*C. canorus*), dissected on the 30th of May last. Some facts were observed that were thought of sufficient interest to place before the Society. A perfect egg was found in the oviduct, ready for expulsion, and about fifty in the ovary; two of the size of large peas, the others much smaller; a circumstance which tends to confirm the opinion that the eggs of this bird are deposited at intervals of seven or eight days.

The gizzard was lined with a hair-like substance, which, under the microscope, proved to be the spines from the legs of beetles. The gizzard contained a large quantity of the remains of the Cockchafer, and one of the Click-beetles, but no trace of a Caterpillar was discovered. In 1834 Mr. Thompson exhibited the gizzard of a Cuckoo at the Society (Proceedings, p. 29), and at first the hairy lining was supposed to be a natural structure, but Prof. Owen, on microscopic examination, believed that the hairs were from the larva of the Tiger-moth (*Arctia caja*).

Dr. Crisp thought the subject worthy of future inquiry, and that it would be important to ascertain whether this hairy lining is present in the *Caprimulgidæ* and other insectivorous birds. As regards the spines of the beetles and the hairs of the larva of the Tiger-moth, the microscope shows this important difference,—the *hairs* are all

furnished with alternate lateral aciculæ; the spines of the beetles are smooth, with sharp points.

Explanatory drawings of the parts were exhibited.

Dr. Crisp also showed two new species of worms which he had recently obtained; one from the lung of the Egyptian Cobra (*Naja Haje*) which had been in the Society's collection. It is 3 inches long, and its chief peculiarity consists in its annular protuberances, twenty-eight in number.

Dr. Baird has described this worm as a new species, in the British Museum Catalogue, under the name of *Pentastoma annulatum* \*.

The other specimens were two nematoid worms, which Dr. Crisp obtained from the knee-joint of the common Coot (*Fulica atra*). They are of a cylindrical form, highly elastic, and coiled in a spiral manner round each other; the larger of the two, when extended, is about two inches in length, the smaller about an inch and a half; the extremities are tapering; the tail pointed; the head more orbicular. Under a power of 50 diameters, the alimentary canal can be distinctly seen.

Dr. Crisp believed that this worm had not been before described; it most resembled the *Spiroptera Falconis* of Rudolphi, or the *Spiroptera serpentulus* of Diesing. In the Museum of the London College of Surgeons (prep. 170) there are two *Filaria*, one about six inches long, from the knee-joint of the Kangaroo (*Macropus major*): and Diesing, in his 'Systema Helminthum,' 1850, mentions the *Filaria subspiralis*, from the tendons of the foot of a Crane; and the *Spiroptera serpentulus*, from the leg and foot tendons of several species of Falcon.

#### ON A NEW SPECIES OF DENDROCOLAPTES.

BY PHILIP LUTLEY SCLATER.

The fine species of *Dendrocolaptes* which I now bring before the notice of the Society, was discovered by Mr. Wallace in the neighbourhood of Para. My specimen is from the Capin river, where it was collected in June 1849. A second, in Mr. Wallace's own collection, marked 'Para,' is the only other I have seen. Had I not the authority of Mr. Eyton and the Baron de la Fresnaye for considering the present bird as hitherto undescribed, I should hardly have ventured to characterize a species of this family, which is one of those most perplexing to ornithologists, by reason of the great similarity of colouring that pervades the group. The Baron de la Fresnaye, who has lately written a most complete monograph of these birds in the 'Revue de Zoologie,' has mentioned this species in a recent number of that periodical, under the MS. name I had proposed for it when on a visit to him eighteen months ago. This makes it desirable, I think, to give it specific characters at once, in order to avoid the evils of leaving a published name without a published description attached.

\* Described by Dr. Baird at p. 73 of the present volume of this Journal.

The specific name is in honour of Mr. Eyton, who has worked a great deal at the *Dendrocolaptinæ*, and published the results of his labours in the shape of descriptions of several new species, and a general list of the whole subfamily, in the 'Contributions to Ornithology' for last year.

**DENDROCOLAPTES EYTONI**, Sclater. *D. supra cinnamomeo-brunneus*; *caudæ colore intensiore, primariis intus ad apices obscurioribus*; *capitis collique superi plumis nigrescentibus, linea lata mediali fulvo-albida*; *subtus, mento et gula albis*; *pectore toto et ventre summo albido flammulatis, singulis plumis plaga mediali albida utrinque brunneo marginata*; *ventre imo et lateribus fulvis*; *tectricibus subalaribus pallide brunneis*; *rostrò paululum incurvo*; *mandibula superiore nigrescente, inferiore corneo*; *pedibus nigris*.

Long. tota, 9-5; alæ, 4-0; rostri a rictu, 1-9; a fronte, 1-5.

*Hab.* in vicinitate Paræ, imp. Brasiliensis.

July 26.—Dr. Gray, F.R.S., Vice-President, in the Chair.

ON SOME STAPHYLINIDÆ, FOUND IN THE NESTS OF TERMITES. BY M. SCHIÖDTE.

It has long been known that some species of ants keep insects belonging to different orders. The intention of the communication I am going to make is to point out that the same extraordinary phenomenon exists among the Termites.

The insects which I have now the honour to bring under the notice of the Society, dwell amongst a certain species of Termites in the Brazils, and were collected, together with the *Termes*, by Mr. Reinhardt, whilst travelling for the Royal Museum of Natural History in Copenhagen through the province Minas Geraës.

This *Termes* belongs to a peculiar little group of small species, the nests of which are built around branches of trees, and contain in their interior only a labyrinth of uniform passages, without any separate cell for the queen. The soldiers are not much larger than the working individuals, and are nearly as numerous; their head has its greatest dimension in the height; the front extends below in a large horn; the mandibles are not elongated, but exceedingly broad, and have a crenulated edge and a considerable horn on their outside.

From physiological as well as from anatomical reasons I am of opinion, that the constitutional state of the society of Termites is established on the same fundamental laws as the societies amongst the Hymenoptera. Several species of ants have also soldiers. The working Termites are quite different from the larvæ. In the species here mentioned they may be distinguished by the form of the *instrumenta cibaria*, especially by the two teeth at the end of the interior lobe of the maxillæ, which are separated by a pointed incision in the working individuals, but in the larvæ by a rounded one.

The strangers or guests of Termites known to me are *Staphylinidæ*, belonging to the group of *Aleocharini*; they constitute two

new genera. They agree with *Lomechusa* and *Dinarda*, in having a corneous hook on the end of the interior lobe of their maxillæ, but in other respects they present characters in the construction of the parts of the mouth and of the tarsi, which strikingly separate them from all other genera of that group. The abdomen is constructed in a most extraordinary manner, being membranaceous, of an enormous size, bent upwards so as to cover the thorax, and fixed in this position by the dorsal faces of the second and third segments having grown together.

Of one of the genera, which I have named *Corotoca*, two species are known to me (*Corotoca Melantho* and *C. Phylo*); they are about 3 millim. in length from the front to the end of the second segment of the abdomen. Of the first of these I have observed both sexes. The male is a little smaller than the female, but otherwise only to be distinguished by the dissection of the organs of generation.

Of the other genus, named by me *Spirachtha*, the male is still unknown to me. The abdomen is furnished with three pairs of appendages, which are elongate, cylindrical, 2-jointed, membranaceous, and moveable by muscles at the base. These appendages are perhaps intended for the same purpose as the tufts of hairs on the abdomen of the genus *Claviger*, which are known to be sucked by the ants; even in *Lomechusa* there are similar hairy appendages on the sides of the abdomen. Of this genus only one species is known to me (*Spirachtha Eurymedusa*), of about 2 millim. in length, from the front to the end of the second segment of the abdomen.

In the abdomen of both genera I have found eggs in different stages of development, in *Corotoca* even eggs with fully developed larvæ; so that, beyond doubt, these animals are viviparous.

If the *Strepsiptera* are to be considered as belonging to the order *Coleoptera*, an opinion which I endeavoured to prove as early as the year 1840\*, this will be the *second* instance of viviparous *Coleoptera*.

#### Fam. STAPHYLINI.

#### Trib. ALEOCHARINI.

#### Genus COROTOCA.

*Maxillæ mala interiori cornea, uncinata. Palpi maxillares 4-articulati. Ligula lata, rotundata, paraglossis obsolete. Palpi labiales 3-articulati. Tarsi 4-articulati, posteriores articulo primo valde elongato. Abdomen membranaceum, fractum; parte posteriori fixa, maxima, globosa, dorso anteriori animalis superposita. (Κόρη, τίκτω.)*

1. COROTOCA MELANTHO. *Fusca, fronte foveolata, pronoto multifoveolato, disco bituberculato; tibiis posterioribus fusiformibus, fuscis; scutis ventralibus segmenti quarti quintique transversis.*—Mas, Fem.

Long. a fronte ad apicem segmenti secundi abdominis  $2\frac{1}{2}$ –3 mill.

2. COROTOCA PHYLO. *Fusca, vertice foveolato, pronoto multi-*

\* See the introduction to 'Danmark's Eleutherata,' p. 21, note.



*foveolato, disco trituberculato; tibiis posterioribus linearibus, nigro-fuscis; scutis ventralibus segmenti quarti quintique subquadratis.*—Fem.

Long. a fronte ad apicem segmenti secundi abdominis  $2\frac{1}{2}$ — $3\frac{1}{2}$  mill.

#### Genus SPIRACHTHA.

*Maxillæ mala interiori cornea, uncinata. Palpi maxillares 3-articulati. Ligula ampla, rotundata, paraglossis obsolete. Palpi labiales 3-articulati, minutissimi, verruciformes, ligula super-tecti. Tarsi 4-articulati, posteriores articulo primo subelongato. Abdomen membranaceum, maximum, fractum; parte anteriori articuli secundi globosa; parte posteriori fixa, conica, antè ascendente, tribusque utrinque munita appendicibus membranaceis, filiformibus, biarticulatis. (Σπειραχθῆς.)*

**SPIRACHTHA EURYMEDUSA.** *Albissima, membranacea; antennis, capite, scutis thoracicis et abdominalibus pedibusque corneo-membraneis, pallide fuscis, coxis, femorum basi, trochanteribus posticis tibiisque fuscis, oculis fusco-nigris.*—Fem.

Long. a fronte ad apicem segmenti secundi abdominis 2 mill.; lat. segmenti secundi abdominis 1 mill.

November 8.—Dr. Gray, Vice-President, in the Chair.

#### ON THE ANATOMY OF THE WALRUS.

BY PROFESSOR OWEN, F.R.S., F.Z.S. ETC.

Professor Owen communicated the chief results of his dissection of the Walrus (*Trichechus rosmarus*) which died at the Gardens of the Zoological Society, October 1853. The author prefaced his anatomical description by some remarks on the physiognomy, attitudes and movements of the living animal; and more especially dwelt on the superior strength of its fin-shaped limbs, as compared with the ordinary Seals, the Walrus being able, when it moves on dry land, to raise its trunk from the ground—in other words, to walk—a mode of progression which strikingly contrasts with the awkward shuffle of the Seal, as it trails its belly on the earth, aiding its fore fins with the action of its powerful abdominal muscles. Both the bones and muscles of the fins of the Walrus are more powerfully developed than in the Seal, and this, the author concluded, had reference to its natural habitat among bergs and floes of ice, and the necessity of clambering among and over their rough, irregular surfaces. The sex of the animal dissected was female; the mammæ were four in number, two abdominal and two inguinal. There was no trace of external ears. The eye is defended by a circular external eyelid, and by a broad thin *membrana nictitans*; there is a small Harderian, or inner lacrymal gland, but no true lacrymal gland, *punctum lacrymale*, nor *ductus ad nasum*. The subcutaneous cellular tissue was very coarse, tough and elastic, almost granular to the touch, and resembling a *corpus cavernosum*. The disposition of the peritoneum and of the viscera of the abdomen was minutely described, and it was

remarked that the odour of the visceral cavities and parts in this Walrus resembled more that of ordinary land quadrupeds than the peculiar odour noticed in the dissection of Seals; but the flesh of the Walrus was dark coloured, as in the Seal tribe: the young animal dissected, had been fed, since its captivity, on oatmeal, milk, and water. The stomach had the form of an elongated siphon closely bent upon itself. The liver was divided into seven lobes. There was a large gall-bladder. The intestines in this young animal, which did not exceed four feet in length, were seventy-five feet long, the great intestine being only one foot in length, and the *cæcum coli* one inch and a half. The kidneys were very complex, each being made up of about 400 small kidneys or renules, and each of these showing the normal structure of a simple kidney, such as is found in the dog or lion, viz. with the cortical and medullary part, the pelvis, mammilla and ureter. In the description of the viscera of the chest, the large thymus gland was noticed, and the notched or serrated character of the anterior margin of the lungs. The *foramen ovale* and *ductus arteriosus* were both obliterated.

The following is the description of the heart of the Walrus:—The blood is returned into the right auricle by a large precaval and postcaval vein, and by the coronary vein, which terminates close to the latter: there is a small semilunar valve at the coronary orifice, but no eustachian valve. A broad crescentic fold, looking downwards, divides the sinus or fossa receiving the precaval vein, from the larger and deeper one receiving the postcaval vein: this fold answers to the upper border of the ‘fossa ovalis’ in the human heart; there is no orifice in the ‘fossa’ communicating with the left auricle. The appendix of the auricle extends in front of the base of the aorta as far as the pulmonary artery; it gradually contracts to an obtuse point: in the *Cystophora proboscidea* the auricular appendix is short, broad and bifid; in both it is occupied by a reticular arrangement of *carneæ columnæ*. The ventricles are broader in proportion to their length, and the apex is not produced, as in the *Cystophora proboscidea*: the *carneæ columnæ* of the anterior division of the tricuspid valve, and a few of those of the right or external division, are attached to a short and thick fleshy column from the free wall of the ventricle; this column is connected by a short and thick ‘trabecula’ with the septum: most of the other tendinous chords are attached to the septum; and a few to trabeculæ connecting that fixed wall with the free wall of the ventricle. The pulmonary artery presents no peculiarity; it is connected by the ligamentous remnant of the ‘ductus arteriosus,’ which is 10 lines long and 5 lines in diameter, to the under part of the aortic arch, just beyond the origin of the left subclavian; its cavity is obliterated, but a short, thick, semilunar fold of the lining membrane of the aorta, with its concavity turned towards the end of the arch, indicates the place of the former foetal communicating channel. The left auricle and ventricle offer no peculiarities. The coats of the aortic arch are thickest near the origins of the great vessels sent to the head and fore-limbs, especially at the lower part of the arch, where they are 3 lines thick. The right subclavian and carotid arise close together, but scarcely from a common trunk: the left

carotid and left subclavian have more obviously separate origins. The aorta suddenly diminishes beyond those primary branches, where it is connected with the consolidated and contracted 'ductus arteriosus.' There is no arrangement, even in the very young Walrus here described, for accommodating the animal to its aquatic habits, by any direct intercommunication between the right and left sides of the heart. The hepatic veins, in their dilatations, resemble those of the ordinary Seals.

The brain weighed 1 lb. 9 oz. avoird.; its convolutions and structure were described. The hip-joint was found to be devoid of the ligamentum teres. Drawings were exhibited of the viscera of the thorax and abdomen, and the Memoir was terminated by a minute account of the dentition, and a disquisition on the homologies of the teeth of the Walrus, as elucidated by the state of the dentition in the young animal dissected.

Professor Owen detected the following minute teeth exposed or buried in the gum, and adhering to the gum and periosteum of the jaws:—two denticles in each premaxillary bone; two denticles in each maxillary bone; together with a deciduous canine, and four denticles in each ramus of the mandible. He gave the following as the formula of the deciduous dentition of the Walrus:—

$$i \frac{2-2}{2-2}, c \frac{1-1}{0-0}, m \frac{2-2}{2-2} = 18.$$

Of the permanent series, the canine tusks had pushed through the gum, and on laying open the substance of the jaws, the following teeth were found in course of formation:—in the premaxillary, the successor of the second minute incisor; in the maxillary, the successors of the two deciduous molars, together with a third molar. In the lower jaw the successor of the second deciduous incisor, the successors of the two deciduous molars, and a third similar permanent molar. The germ of the permanent tusk, confined to the upper jaw, was 2 inches in length, and, like the germs of the smaller permanent teeth, its base was widely open, and contained a large formative pulp.

In addition to the upper canine tusks, the normal number of permanent and functional teeth in the Walrus is four on each side of both jaws; these teeth are simple, short, thick and obtuse, having the office of grinders. With respect to their nature and homologies, Professor Owen argued that the first, from its position in the premaxillary bone, was an 'incisor'; the two following teeth, by their position in the maxillary bone, and their relation to the deciduous denticles, were 'premolar' teeth; and he also regarded the last of the series of four, from its minor degree of development, as belonging rather to the same (premolar) series, than as being the first of the true molars. As the first of the molariform permanent teeth in the lower jaw passes in front of the permanent incisor above, when the mouth is closed, it must be regarded as an 'incisor'; the other three grinders as being 'premolars,' two being proved to be such by displacing vertically their predecessors, and the third also appearing to be of the same series by its state of development. The Professor

accordingly proposed the following as the formula of the normal or functional dentition of the Walrus:—

$$i \frac{1-1}{1-1}, c \frac{1-1}{0-0}, p \frac{3-3}{3-3} = 18.$$

But, as might be expected in a dentition deviating so remarkably from that of other Mammals of the same order, varieties are not unfrequently met with in the number of the teeth of the Walrus. Professor Owen cited instances of such varieties in ten skulls of the Walrus, of different ages and sex. The result of which was, that occasionally a small tooth was found anterior to the normal series of four, and more commonly in the upper than in the lower jaw; and that, more rarely, a small tooth was superadded behind the normal four, in the upper jaw, and still more rarely in the lower jaw: the formula of the dentition of such varieties, in excess, being,—

$$i \frac{2-2}{2-2}, c \frac{1-1}{0-0}, p \frac{3-3}{3-3}, m \frac{1-1}{1-1} = 26.$$

The additional anterior small incisor was due either to the retention and growth of the first deciduous denticle, or to the development of a small successor to it. The additional posterior grinder was due to the occasional development of a germ in the back part of the gum or jaw. The minute milk-teeth relate, by their gubernacula, to the development of the permanent teeth, but seem never to be put to use themselves; the milk-canine was buried in the gum outside the protruded point of the permanent canine; so that this tooth is extricated and cuts the gum before the tooth of which it is the successor makes its appearance, that tooth being probably removed by absorption. Here, therefore, was another instance, analogous to that of the rudimental teeth in the fetal Whale, of parts developed without any obvious office as organs of mastication, but serving to illustrate the relation of adhesion to a more normal type of dentition. In conclusion, Professor Owen remarked that the food of the Walrus consisted, in a state of nature, of sea-weed, crustaceans and mollusks; and that although, by the totality of its organization, it must be placed near the Seals, and with them be classed in the order *Carnivora*, yet that the incisors and premolars were alike well adapted to pound marine plants, and to break and crush shells. Fragments of a bivalve shell, a species of *Mya*, had been found with pounded sea-weed, by the Surgeon of Parry's Polar Expedition, in the stomach of a full-grown Walrus. The great descending canine tusks serve as weapons of offence and defence, and to aid the animal in mounting and clambering over ice-blocks, bergs and floes in the Arctic Seas, in which the Walrus has been organized to enjoy its existence.

#### ROYAL SOCIETY.

November 23, 1854.—Thomas Bell, Esq., V.P., in the Chair.

“On the Impregnation of the Ovum in the Stickleback.” By W. H. Ransom, M.D.

I purpose placing before the Royal Society in this communication,